

Notice of Allowability

Application No.

10/008,492

Examiner

Matthew C. Sams

Applicant(s)

FRANK, MICHAEL L.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 10/21/2005.
2. ☒ The allowed claim(s) is/are 1 and 7.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

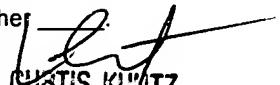
* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 20051129.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other


CURTIS KUNTZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

EXAMINER'S AMENDMENT AND STATEMENT OF REASON'S FOR ALLOWANCE

Drawings

1. The drawings were received on 10/21/2005. These drawings are accepted.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Pamela Lau Kee on 11/29/2005.

The application has been amended as follows:

1. (Currently Amended) A differential radio comprising:

- a differential antenna having an input and an output;

- a differential duplexer including film bulk acoustic resonators, generating two receiving signals and receiving two transmitting signals, electrically connected to the input and output of the differential antenna;

- a differential low noise amplifier, receiving the two receiving signals, generating two LNA signals, including,

- an input matching network (IMN) having a differential input and a first and second IMN output;

- a first capacitor, connected to the drain of the first FET;

a second FET, having a gate connected to the first capacitor;

a third FET, having a source connected to the source of the second FET [at a first node];

an output matching network (OMN), having a first input connecting to the drain of the second FET and a second input connecting to the drain of the third FET;

a first inductor connecting between the source of the second FET and ground;

a second capacitor connected to the gate of the third FET;

a fourth FET having a drain connected to the second capacitor, a gate connected to the second IMN output, a source connected to the source of the first FET; and

a second inductor connects between the source of the first FET and ground;

a differential filter receiving the two LNA signals and generating a first differential filter signal;

a first differential mixer receiving the first differential signal and generating a first differential mixer output signal;

a signal processing section, receiving the first differential mixer output signal, generating a conditioned differential signal;

a second differential mixer, receiving the conditioned differential signal, generating a second differential mixer output signal;

a second differential filter, receiving the second differential mixer output signal, generating a second differential filter signal; and

a differential power amplifier receiving the second differential filter signal and generating the two transmitting signals.

Examiner's Statement of Reasons for Allowance

3. Claims 1 & 7 are allowed.
4. The following is an examiner's statement of reasons for allowance:

Applicant's invention is drawn to integrated circuit design to reduce substrate leakage, the effects of package parasitics and reduced shielding in a cell phone handset by using a set of differential front-end components that includes an antenna printed onto a circuit board, a differential low noise amplifier, a differential duplexer implemented with film bulk acoustic resonators, differential filters, differential mixers and a differential power amplifier.

Applicant's independent claim 1 recites, *inter alia*, a differential radio with an antenna, a differential duplexer with film bulk acoustic resonators to generate two receiving signals and two transmitting signals coupled to the input and output of the antenna, a differential low noise amplifier with the specific configuration shown in Fig. 4, a differential filter for receiving the output of the low noise amplifier, two differential mixers, a second differential filter and a differential power amplifier for generating two transmitting signals as shown in Fig. 2. Applicant's claim 1 comprises a particular combination, which is neither taught nor suggested by the prior art.

Conclusion

5. Accordingly, Applicant's claims are allowed for these reasons and for the reasons recited by the Applicant in the amendment filed on 2/16/2005 and 9/16/2005.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

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accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Sams whose telephone number is (571)272-8099. The examiner can normally be reached on M-F 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz can be reached on (571)272-7499. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MCS
11/29/2005


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